

# Notice of Allowability

Application No.

09/631,805

Examiner

Khanh Tran

Applicant(s)

LAROIA ET AL.

Art Unit

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## -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the Amendment filed on 09/28/2004.
2. ☒ The allowed claim(s) is/are 1-20.
3. ☒ The drawings filed on 08 April 2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

### Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

TESFALDET BOURE  
PRIMARY EXAMINER

1. The Amendment filed on 09/28/2004 has been entered. Claims 1-20 are pending in this Office action.

### ***Response to Arguments***

2. Applicant's arguments, see pages 9-10 of the Remarks, filed on 09/28/2004, with respect to claims 17-20 under 35 U.S.C 103(a) have been fully considered and are persuasive. The rejection of claims 17-20 has been withdrawn after Applicants amended claims to include uniquely distinct features.

### ***Reasons for Allowance***

The following is an examiner's statement of reasons for allowance:

3. Regarding claim 1, said claim is allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a method for providing adaptation of an antenna array in a base station associated with a cell of a cellular wireless communication system, the method comprising the uniquely distinct steps of "processing the estimated spatial covariance matrices to generate an estimate of an interference matrix for the plurality of mobile stations" and "estimating an array response for the given mobile station from the interference matrix". It is noted that the closest prior, Kuwahara et al. US 6,597,678 B1 teaching radio communication system using adaptive array antenna and Kohno et al. US 6,728,294 B1 teaching radio

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communication system, fails to anticipate or render the above underlined limitations obvious.

4. Regarding claim 15, said claim is allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose an apparatus for use in a base station associated with a cell of a cellular wireless communication system and having an antenna array, the apparatus comprising the uniquely distinct features of "to process the estimated spatial covariance matrices to generate an estimate of an interference matrix for the plurality of mobile stations" and "to estimate an array response for the given mobile station from the interference matrix".

It is noted that the closest prior, Kuwahara et al. US 6,597,678 B1 teaching radio communication system using adaptive array antenna and Kohno et al. US 6,728,294 B1 teaching radio communication system, fails to anticipate or render the above underlined limitations obvious.

5. Regarding claim 16, said claim is allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose an apparatus for providing adaptation for an antenna array in a base station associated with a cell of a cellular wireless communication system, the apparatus comprising the uniquely distinct features of "means for processing the estimated spatial covariance matrices to generate an estimate of an interference matrix for the plurality of mobile stations" and "means for estimating an array response for the given mobile station from

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the interference matrix". It is noted that the closest prior, Kuwahara et al. US 6,597,678 B1 teaching radio communication system using adaptive array antenna and Kohno et al. US 6,728,294 B1 teaching radio communication system, fails to anticipate or render the above underlined limitations obvious.

6. Regarding claim 17, said claim is allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a method for providing adaptation of an antenna array in a base station associated with a cell of a cellular wireless communication system, the method comprising the uniquely distinct steps of "wherein the unique hopping sequence specifies for the given mobile station a hopping between tones of a plurality of orthogonal frequency division multiplexed tones, each of the mobile stations being assigned one or more of the tones for use in conjunction with transmission of a corresponding symbol, the tone assignments being changed for the mobile stations on a symbol-by-symbol basis". It is noted that the closest prior, Kuwahara et al. US 6,597,678 B1 teaching radio communication system using adaptive array antenna and Kohno et al. US 6,728,294 B1 teaching radio communication system, fails to anticipate or render the above underlined limitations obvious.

7. Regarding claim 18, said claim is allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose an apparatus for use in a base station associated with a cell of a cellular wireless

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communication system and having an antenna array, the apparatus comprising the uniquely distinct features of "wherein the unique hopping sequence specifies for the given mobile station a hopping between tones of a plurality of orthogonal frequency division multiplexed tones, each of the mobile stations being assigned one or more of the tones for use in conjunction with transmission of a corresponding symbol, the tone assignments being changed for the mobile stations on a symbol-by-symbol basis". It is noted that the closest prior, Kuwahara et al. US 6,597,678 B1 teaching radio communication system using adaptive array antenna and Kohno et al. US 6,728,294 B1 teaching radio communication system, fails to anticipate or render the above underlined limitations obvious.

8. Regarding claim 19, said claim is allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose an apparatus for providing adaptation for an antenna array of a base station associated with a cell of a cellular wireless communication system, the apparatus comprising the uniquely distinct features of "wherein the unique hopping sequence specifies for the given mobile station a hopping between tones of a plurality of orthogonal frequency division multiplexed tones, each of the mobile stations being assigned one or more of the tones for use in conjunction with transmission of a corresponding symbol, the tone assignments being changed for the mobile stations on a symbol-by-symbol basis". It is noted that the closest prior, Kuwahara et al. US 6,597,678 B1 teaching radio communication system using adaptive array antenna and Kohno et al. US 6,728,294 B1

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teaching radio communication system, fails to anticipate or render the above underlined limitations obvious.

9. Regarding claim 20, said claim is allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose an apparatus for use with a base station associated with a cell of a cellular wireless communication system and having an antenna array, the apparatus comprising the uniquely distinct features of "wherein the unique hopping sequence specifies for the given mobile station a hopping between tones of a plurality of orthogonal frequency division multiplexed tones, each of the mobile stations being assigned one or more of the tones for use in conjunction with transmission of a corresponding symbol, the tone assignments being changed for the mobile stations on a symbol-by-symbol basis". It is noted that the closest prior, Kuwahara et al. US 6,597,678 B1 teaching radio communication system using adaptive array antenna and Kohno et al. US 6,728,294 B1 teaching radio communication system, fails to anticipate or render the above underlined limitations obvious.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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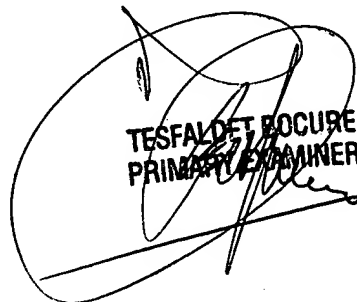
**Conclusion**

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 571-272-3007. The examiner can normally be reached on Monday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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TESFALDET BOCURE  
PRIMARY EXAMINER